① State

1. 2 indep SRS

2. $n_1 p_1 \geq 10$
   $n_1(1-p_1)$
   $n_2 p_2$
   $n_2(1-p_2)$

3. $pop_1 \geq 10 \cdot n_1$
   $pop_2 \geq 10 \cdot n_2$

Check

1. circled

2. 198
   102 $\not\geq 10$
   180 $\surd$
   170

3. pop1 $\geq$ 3000
   pop2 $\geq$ 3500

ⓐ $H_0: p_1 = p_2$

$H_a: p_1 > p_2$

$$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} = 3.754$$

$P(z > 3.754) = 8.7 \times 10^{-5}$

- reject H_0

ⓑ $\hat{p}_1 - \hat{p}_2 \pm z^* \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}} = (0.06719, 0.22423)$

We are 96% conf. that the diff. btw. the prop. of ....

② $\hat{p} = \frac{18+15}{50+75} = 0.264$

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③ State

1. SRS
2. $np \geq 10$, $n(1-p) \geq 10$
3. pop $\geq 10n$

Check

1. circled
2. $380 \not\geq 10$, $503 \not\geq 10$
3. pop $\not\geq 8830$

$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = (0.39769, 0.46301)$

we are 95% conf that....

(4) a) $0.05 = 1.645\sqrt{\frac{(0.5)(0.5)}{n}}$ $n = 271$

b) $0.05 = 1.645\sqrt{\frac{(0.04)(0.96)}{n}}$ $n = 42$

(5) $(0.15, 0.19)$

0.17 ± 0.02

↑ conf.

$$0.02 = z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$0.02 = z^* \sqrt{\frac{(0.17)(0.83)}{1703}}$$

$z^* = 2.197$

normcdf(-2.197, 2.197, 0, 1)

$= 0.972$

97.2% confidence

(6) a) State

1. SRS

2. $np \geq 10$, $n(1-p) \geq 10$

3. $pop \geq 10n$

Check

1. circled

2. $(0.13)(300) \not\geq 10$, $(0.87)(300) \geq 10$

3. $pop \geq 3000$

$H_0: p = 0.20$

$H_a: p \neq 0.20$

$$z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} = -3.031$$

2. $P(z < -3.031) = 0.002$

– reject H_0

b) $\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = (0.07999, 0.18001)$

We are 99% conf. that ....